CLAIMS:

1.   A method of coding an input digital video sequence corresponding to an original color image sequence, said method comprising at least the following steps :

(1)   a converting step, provided for converting said video sequence from the original spatial representation domain to less representation data ;

(2)   a quantization step, provided for transforming the converted signals thus obtained into a reduced set of data ;

(3)   an encoding step, provided for coding said reduced set of data ;
said coding method being further characterized in that it also comprises :

(4)   before said converting step, a pre-processing step, provided for determining if the color space of the input video sequence is the YUV color space, where Y is the luminance component and U, V the chrominance components, and transforming said YUV color space into a less redundant color space by means of a non-linear transformation taking into account the possible lower quality finally obtained.

2.   A coding method according to claim 1, in which said pre-processing step is an operation consisting in compressing the luminance dynamic by using a number M of grey levels lower than the original number N before said compression operation, said compression operation being characterized in that said luminance dynamic of N grey levels is divided into a central range [A ; B] and two side ranges [0 ; A] and [B ; N-1], and the original side ranges [0 ; A], [B ; N-1] are transformed by means of the compression operation into transformed side ranges [0 ; C], [D ; M-1], with [0 ; C] lower than [0 ; A] and [D ; M-1] lower than [B ; N-1], the original central range [A ; B] being kept unchanged.

3.   A coding method according to claim 2, characterized in that the compression in said side ranges is uniform.

4.   A coding method according to claim 1, in which said pre-processing step is an operation consisting in compressing the luminance dynamic by using a number M of grey levels lower than the original number N before said compression operation, said compression

operation being characterized in that said luminance dynamic of N grey levels is divided into a central range [A ; B] and two side ranges [0 ; A] and [B ; N-1], and the original central range [A ; B] and side ranges [0 ; A] [B ; N-1] are transformed by means of the compression operation respectively into a transformed central range

5   [C ; D] and into transformed side ranges [0 ; C], [D, M-1], with [0 ; C] lower than [0 ; A], [C ; D] lower than [A ; B] and [D ; M-1] lower than [B ; N-1], the compression ratio applied to the original central range [A ; B] being lower than the one applied to the original side ranges.

10   5.   A coding method according to claim 4, characterized in that the compression ratio in said central and side ranges is uniform.

       6.   A coding method according to anyone of claims 2 and 4, characterized in that the compression in said side ranges is adaptive and piecewise continuous, the luminance
15   compression being progressively lessened in the part of each of said side ranges which is contiguous to the central range.

       7.   A coding method according to claim 6, characterized in that one or several affine functions are used for the progressive lessening of the luminance compression in said
20   contiguous parts.

       8.   A coding method according to claim 6, characterized in that sigmoid functions are used for the progressive lessening of the luminance compression in said contiguous parts.

25   9.   A coding method according to anyone of claims 5 to 7, characterized in that, after the luminance dynamic compression, some transformed values are still clustered in the side ranges, in view of a further dynamic compression in said ranges.

       10.   A device for coding an input digital video sequence corresponding to an
30   original color image sequence, said device comprising at least :
       (1)   converting means for converting said video sequence from the original spatial representation domain to less representation data ;
       (2)   quantization means for transforming the converted signals thus obtained into a reduced set of data ;

(3)   encoding means for coding said reduced set of data ;

said coding device being further characterized in that it also comprises :

(4)   before said converting means, pre-processing means for determining if the color space of the input video sequence is the YUV color space, where Y is the luminance component and U, V the chrominance components, and transforming said YUV color space into a less redundant color space by means of a non-linear transformation taking into account the possible lower quality finally obtained.

11.   A coding device according to claim 10, in which said pre-processing means are a compression stage in which the luminance dynamic is reduced by using a number M of grey levels lower than the original number N before compression, said luminance dynamic of N grey levels being divided into a central range [A ; B] and two side ranges [0 ; A] and [B ; N-1], the original side ranges [0 ; A], [B ; N-1] being transformed by means of the compression operation into transformed side ranges [0 ; C], [D ; M-1], with [0 ; C] lower than [0 ; A] and [D ; M-1] lower than [B ; N-1], and the original central range [A ; B] being kept unchanged.

12.   A coding device according to claim 10, in which said pre-processing means are a compression stage in which the luminance dynamic is reduced by using a number M of grey levels lower than the original number N before compression, the compression operation being such that said luminance dynamic of N grey levels is divided into a central range [A ; B] and two side ranges [0 ; A] and [B ; N-1], and the original central range [A ; B] and side ranges [0 ; A] [B ;.N-1] are transformed by means of the compression operation respectively into a transformed central range [C ; D] and into transformed side ranges [0 ; C], [D, M-1], with [0 ; C] lower than [0 ; A], [C ; D] lower than [A ; B] and [D ; M-1] lower than [B ; N-1], the compression ratio applied to the original central range [A ; B] being lower than the one applied to the original side ranges.

13.   A system comprising a computer usable medium having computer readable program code means embodied therein for implementing a digital video coding device provided for coding an input digital video sequence corresponding to an original color image sequence, said computer readable program code means comprising the following computer readable program codes :

-        .   a program code for causing said computer to detect if the color space of the input color video sequence is the YUV color space, where Y is the luminance component and U, V the chrominance components, and to transform said YUV color space into a less redundant color space ;

5   -   a program code for causing said computer to convert said transformed sequence from the original spatial representation domain to a new representation domain with less representation data ;

-        a program code for causing said computer to perform a quantization of said converted sequence ;

10   -   a program code for causing said computer to encode the quantized data thus obtained.

14.   A method of decoding signals coded by means of a coding method applied to an input digital video sequence itself corresponding to an original color image sequence, said

15   coding method comprising at least the following steps :

(1)   a converting step, provided for converting said video sequence from the original spatial representation domain to less representation data ;

(2)   a quantization step, provided for transforming the converted signals thus obtained into a reduced set of data ;

20   (3)   an encoding step, provided for coding said reduced set of data ;

(4)   before said converting step, a pre-processing step, provided for determining if the color space of the input video sequence is the YUV color space, where Y is the luminance component and U, V the chrominance components, and transforming said YUV color space into a less redundant color space by means of a non-linear transformation taking into account

25   the possible lower quality finally obtained ;

said decoding method being characterized in that it comprises the following steps :

(1)   a decoding step, provided for decoding said coded signals ;

(2)   an inverse quantization step, applied to the decoded signals thus obtained ;

30   (3)   an inverse converting step, provided for concerting the inverse quantized signals thus obtained to the original spatial representation domain ;

(4)   a post-processing step, provided for carrying out on the inverse converted signals thus obtained an inverse transformation with respect to the non-linear transformation provided in said pre-processing step.

15.　　　　　　A device for decoding signals by means of a decoding method according to claim 14.

5　16.　　　　　　A system comprising a computer usable medium having computer readable program code means embodied therein for implementing a digital video decoding method according to claim 14.